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This quarter's issue of BREAKTHROUGH offers our Professional Membership an update on the six projects initiated at The Monroe Institute's (TMI) Fifth Annual Professional Seminar of August, 1987. We salute the project leaders and groups who have devoted their time and effort to furthering the Professional Membership's mission of exploring and expanding the applications of Hemi-Sync technology.

NEUROPHYSIOLOGY EFFECTS & HEMI-SYNC® AUTOMATION UPDATE

by Project Leader Skip Atwater

During last summer's Professional Division Seminar, several working groups were formed around areas of professional interest to various participants. In general terms, the goal of these working groups was (is) to develop Hemi-Sync modus operandi which would (will) benefit them in their own professional areas of interest—education, medicine, counseling, etc.

The above titled Working Group, however, was formed for a different reason. Expertise was recruited for the purpose of developing an automated Hemi-Sync device. Specifically, a computer which would generate binaural beats based on an individual's real-time electroencephalogram (EEG) frequencies.

It was originally thought that the goals of the Working Group could be achieved in the Professional Division's format of non-resident expertise and support. It soon became obvious, however, that a centralized effort would be required which would produce results far beyond the original goals outlined by the Working Group.

This was due, for the most part, to the Working Group's discovery of a newly emerging technology known by the coined term "BEAM" (Brain Electrical Activity Mapping - BEAM is a trademark and a federally registered service mark) which promises to revolutionize EEG concepts. BEAM equipment was invented by Dr. Frank Duffy of Children's Hospital Medical Center, Boston, MA, and David Culver of Braintech, a manufacturing company located in New Jersey.

BEAM equipment is a neurophysiological diagnostic device which converts the output of a 20-channel EEG into a color-contour map of the electrical activity at the surface of the brain. This device, like an EEG, collects data on the changes in electrical activity in the brain using non-invasive electrodes which are placed on the scalp. The BEAM equipment, however, converts this information into a computer readable form, analyzes the information, and displays the results as a stylized color oval image of the head in two dimensions. Different shades of color

are assigned to different voltages and/or frequencies and therefore subtle electrical variances are presented in stark contrast.

BEAM equipment can also be used for synthesizing and displaying information from an evoked potential (EP). EPs are reactions by the brain to a sudden stimulus, e.g., a flash of light. The stimulus is rapidly repeated hundreds of times in order to obtain a measurable response. BEAM equipment is able to gather and translate this information into moving images of stimulated brain activity.

In addition to describing the brain electrical activity for a given subject, this device can compare the data from one subject with the average data from a population of control subjects. This technique is called “Significance Probability Mapping” and shows areas of the brain which are at variance with the control group (abnormal) and the extent of the variance (abnormalities).

The main benefit of the BEAM equipment lies in its ability to extract and display information. The statement has been made that the numerous parallel rows of jagged lines of a modern EEG often present a bewildering array of data. Before BEAM, neurologists had to scan reams of printouts and interpret this information by visualizing in their minds an overall image. BEAM equipment, however, is able to convert EEG data, via a computer, into color images capable of revealing subtle changes in brain electrical activity.

Studies on the clinical efficacy of the BEAM equipment indicate improvements in the ability to diagnose some neurological conditions. For example, this device was shown to be 80%-90% successful in the prospective statistical discrimination between normal children and those with a specific reading disability (pure dyslexia). BEAM technology has also been 80% effective in objectively identifying subjects who suffer from schizophrenia (as diagnosed by conventional means) when compared to normal subjects. Additional clinical uses of this equipment to date include the following: epilepsy, head trauma, depression, learning disability, tumor, and degenerative diseases; as well as “softer” conditions or states of consciousness such as anxiety, elation, relaxation, and stress.

Brain mapping is an emerging technological development likely to achieve wide acceptance and use. At this time, obsolescence for topographical brain mapping is not anticipated.

Since the BEAM equipment’s original development, several companies have taken this technology further and offered their own versions of the original. The Working Group conducted inquiries of these companies and their devices because any automation of Hemi-Sync frequencies should be based on the best EEG data technology can provide.

After a thorough investigation, the Working Group recommended that TMI purchase a BEAM-type device called the NEUROMAP SYSTEM 20 from the NeuroMap Medical Corporation, Boulder, CO, and additionally, fund a research/laboratory effort which would:

1. Objectively document the physiological (EEG and other) effects of current Hemi-Sync technology.
2. Develop improved Hemi-Sync processes, including the possibility of physiologically automated sound patterns.
3. Provide individualized, professionally monitored, personal sessions for those who wish to examine their own brain patterns within a Hemi-Sync environment.

TMI has accepted the recommendation of the Working Group. Negotiations with NeuroMap Medical Corporation involving hardware requirements and customized software requirements are ongoing (as of the date of this writing). If all goes as expected, delivery of the NEUROMAP SYSTEM 20 will be in the Fall (1988).

The probable scope of a first year pilot effort includes, but is not limited to, the following issue:

What are the brain wave patterns resulting from exposure to specific binaural beat signals (Hemi-Sync)?

Given this question, a number of areas of interest to TMI can be investigated. Several of these are listed below:

1. Is there a recognizable topographic EEG pattern for a single subject over a series of trials with the same signals?
2. Is there a recognizable similarity in topographic EEG patterns across subjects?
3. If there is a similarity across subjects, what are the common characteristics?
4. If there is a common topographic EEG pattern across subjects, does the pattern include characteristics that make the appellation “Hemi-Sync” appropriate (in terms of both neurological and wave form characteristics)?
5. If there is not a recognizable topographic EEG pattern for all subjects, are there subgroups which show similar patterns? What is the nature of these subgroups?
6. Do the following subgroups have patterns in common: naive subjects, gifted subjects, channelers, third-party reporters, remote viewers, men, women, Meyers-Briggs personality profiles, GATEWAY participants, etc.?
7. With respect to the above questions, what variations in brain wave patterns result from different binaural beat signals (including phased pink sound only)?

It is expected to take approximately one year (300-500 lab sessions with 25 volunteer subjects) to deal with these first issues. The payoff to TMI during this first year would lie not only in the inherent interest in answers to the above questions, but also in the potential of

findings for program improvement in resident and non-resident TMI educational programs, in the Explorer Program, in support to the Professional Division, and in TMI Laboratory operations. It is during this first year that we at TMI will learn a great deal about this new BEAM technology, its analytical capacity, and the best way to use it in support of all of TMI's efforts.

It is also anticipated that selected "gifted subjects" can be "mapped" during this first year as an adjunct to the formal pilot study. "Gifted subjects" may provide data which would enable TMI to develop specific Hemi-Sync patterns for "gifted talents." Armed with the results of the one-year pilot study, we at TMI can formulate the effective future use of the TMI lab research program and its support of TMI's stated goals.

The original goals of the Working Group have changed. The Working Group wishes to provide support to the extent that it can; especially in the development of physiologically automated Hemi-Sync based on the finding of the TMI Laboratory effort.

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